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09/04/2008

EXAMINER

CALANDRA, ANTHONY J

ART UNIT	PAPER NUMBER
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1791

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/566,046	Applicant(s) DOELLE ET AL.	
	Examiner ANTHONY J. CALANDRA	Art Unit 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 May 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 19-45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Detailed Office Action

1. The communication dated 5/27/2008 has been entered and fully considered.
2. Claims 19-45 are currently pending.

Specification

3. In light of amendment the objection to the specification has been withdrawn.

Claim Objections

4. In light of amendment the objection to the claims have been withdrawn.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 19-45 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 19, applicant discloses a method for loading fibrous stock. Applicant states that the process does not utilize ***any*** machinery for homogenizing the fibrous stock. This statement is unclear as the applicant claims a refiner which clearly homogenizes the stock. Applicant further claims in claim 24 a static mixer and intermediate vat. Therefore it is not clear to the examiner where homogenizing can and cannot occur. The overly broad statement of not utilizing ***any*** machinery would seem to include machinery that the applicant is claiming but which also homogenizes the fibrous stock (refiner, intermediate tank and static mixer). As such the examiner cannot determine the proper metes and bounds of patent protection desired by the applicant. Applicant should clearly state when in the process that no homogenizing is allowed.

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A second interpretation of the applicants claim language is that a static mixer is not machinery for homogenizing. Applicant may interpret a static mixer as not being machinery as the mixer itself doesn't have moving part. However, machinery is defined as, *a device or means of achieving or effecting a result*. Therefore even though the static mixer does not have moving parts it is still machinery. Further, the pumps which pump calcium oxide and the stock are rotating machinery and required for the static mixer to work.

Claims 20-43 are dependent on claim 19 and are similarly rejected.

In claim 45, applicant discloses an apparatus for loading fibrous stock. Applicant states that the apparatus does not include any machinery for homogenizing the fibrous stock. This limitation is unclear as to where the apparatus cannot homogenize stock as the apparatus contains a static mixer which homogenizes the stock with calcium hydroxide thus the claim is contradictory. Further, the disperger or refiner will act to homogenize the stock. As such the examiner cannot determine the proper metes and bounds of patent protection desired by the applicant. Applicant should clearly state when no homogenizing is allowed. Examiner has interpreted the claim as not having any machinery for homogenizing the stock after the static mixer for mixing calcium hydroxide and before the at least one disperger and a refiner.

Response to Arguments

7. Applicant's arguments filed 5/27/2008 have been fully considered but they are not persuasive.

Applicant argues that none of the references cited or in combination disclose the limitation of "not utilizing any machinery for homogenizing the fibrous stock suspension

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for independent claims 19 and 45. Applicant argues that the dependent claims are allowable based on claim 19 being allowable.

Examiner notes the 112 2nd rejection in which the applicant has not clearly stated where and when homogenization is allowed and not allowed. For purpose of examination, the examiner has interpreted the claim as allowing homogenization of the stock and calcium oxide (because applicant has a static mixer) and allowing homogenization during refining and after refining. The examiner has interpreted the claim as only not allowing homogenization after the calcium oxide is added and before the fibrous suspension reaches the refiner.

A second interpretation of the applicants claim language is that a static mixer is not machinery for homogenizing. Applicant may interpret a static mixer as not being machinery as the mixer itself doesn't have moving part. However, machinery is defined as, a device or means of achieving or effecting a result. Therefore even though the static mixer does not have moving parts it is still machinery. Further, the pumps which pump calcium oxide and the stock are rotating machinery and required for the static mixer.

In the reference KLUNGNESS, applicant argues that KLUNGNESS discloses a mixer to mix the pulp suspension with the calcium oxide (column 7 lines 16-41). Subsequent to mixing the calcium oxide the pulp is fed into a refiner which has a transfer screw [column 7 lines 15-41]. Examiner notes that this transfer screw only moves the fiber and does not homogenize it. KLUNGNESS does not disclose a screw press or a conditioning machine subsequent to the calcium oxide/hydroxide mixing device and prior to the refiner. Therefore based on the examiners first interpretation that no homogenizing is allowed between the calcium oxide mixing and the refiner, KLUNGNESS clearly

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meets this limitation as the pulp is only mixed with calcium oxide and then sent to the refiner with no intervening steps.

The second possible interpretation is that a static mixer is not machinery for homogenizing. In this case it would have been obvious to a person of ordinary skill in the art to substitute a static mixer for the rotating mixer of KLUNGNESS. A person of ordinary skill in the art would expect a static mixer to mix the pulp and calcium oxide/hydroxide just as a rotating mixer would mix both. U.S. Patent 4,943,349 discloses that for paper making fillers can be introduced to pulp by way of static mixers or by way of dynamic mixers (rotating mixer). At the time of the invention it would have been obvious to a person of ordinary skill in the art to substitute a rotating dynamic mixer for a static mixer of GOMEZ to achieve the predictable result of mixing the pulp with the calcium oxide. It is *prima facie* obvious to substitute one known component for another known equivalent component to achieve a predictable result.

Double Patenting

8. *Examiner acknowledges that the applicant awaits final disposition of copending cited documents before taking action on the double patenting issues.*

9. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

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A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

10. Claims 19-45 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 23-47 of copending Application No. 10/596313 in view of U.S. Patent Publication 2003/0010463 DOELLE, hereinafter DOELLE. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of both applications claim loading fibers with calcium carbonate by adding calcium hydroxide or calcium carbonate to the fiber suspension and then introducing carbon dioxide.

As for claim 19, the copending application claims loading a fibrous suspension with calcium carbonate (*A method of loading a fibrous stock suspension containing chemical pulp* [see e.g. claim 23]). The copending application then claims adding aqueous or dry calcium hydroxide or dry calcium oxide (*fibers with calcium carbonate, comprising the steps of: adding one of calcium oxide and calcium hydroxide in one of a liquid form and a dry form into the fibrous stock suspension* [see e.g. claim 23]). The copending application further claims adding carbon dioxide and claims that 0.3 to 8 kWh/t of energy is added to the fibers and that a refiner can be used (*adding gaseous carbon dioxide into the fibrous stock suspension; precipitating of the calcium carbonate through said carbon dioxide; and refining of the fibrous stock suspension during said precipitating step* [see e.g. claim 23, 42, and 44]).

As for claim 45, the copending application claims a device for loading cellulose fibers with calcium carbonate (*A fibrous stock suspension loading apparatus, comprising: a static mixer mixing calcium hydroxide into the fibrous stock suspension* [see e.g. claim 44]). The copending application claims at least one of a refiner, disperger or fluffer FLPCC reactor (*and at least one of a disperger and a refiner for one of fluffing and refining of the fibrous stock suspension and to precipitate the calcium hydroxide in a carbon dioxide atmosphere while creating fibers that are loaded with calcium carbonate in the fibrous stock suspension* [see e.g. claim 44]).

The copending claims do not teach the crystal size or the reaction pressure that the fiber loading process takes place at. DOELLE discloses the crystal size of 0.3 – 2.5 micrometers and the reaction pressure of 0.5 to 3 bar. At the time of the invention it would have been obvious to use the reaction pressures of DOELLE to obtain the crystal sizes taught by DOELLE in the invention taught by the claims of the copending application. Since the conditions of producing calcium carbonate in DOELLE were known in the art it would be *prima facie* obvious to substitute the conditions of DOELLE for the process of the copending claims.

This is a provisional obviousness-type double patenting rejection.

11. Claims 19-45 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 7-53 of copending Application No.11/608029. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of both applications claim loading fibers with calcium carbonate by adding calcium hydroxide or calcium carbonate to the fiber suspension and then introducing carbon dioxide and refining the stock. While

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the copending claims teach an intended use and also washing the fiber, this does not preclude the one-way obviousness over the instant application.

As for claim 19, the copending application claims loading a fibrous suspension with calcium carbonate (*A method of loading a fibrous stock suspension containing chemical pulp* [see e.g. claim 7]). The copending application then claims adding aqueous or dry calcium hydroxide or dry calcium oxide (*fibers with calcium carbonate, comprising the steps of: adding one of calcium oxide and calcium hydroxide in one of a liquid form and a dry form into the fibrous stock suspension* [see e.g. claim 7]). The copending application further claims adding carbon dioxide and claims refining the fibers (*adding gaseous carbon dioxide into the fibrous stock suspension; precipitating of the calcium carbonate through said carbon dioxide; and refining of the fibrous stock suspension during said precipitating step* [see e.g. claim 7]).

As for claim 45, the copending application claims a device for loading cellulose fibers with calcium carbonate (*A fibrous stock suspension loading apparatus, comprising: a static mixer mixing calcium hydroxide into the fibrous stock suspension* [see e.g. claim 52]). The copending application claims a static mixer and a processing unit (*and at least one of a disperger and a refiner for one of fluffing and refining of the fibrous stock suspension and to precipitate the calcium hydroxide in a carbon dioxide atmosphere while creating fibers that are loaded with calcium carbonate in the fibrous stock suspension* [see e.g. claim 52]). The copending claim 52 does not state what the processing unit is but the method claim of copending claim 7 and 34 claim refiners, dispergers and fluffer FLPCC reactors.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

12. Claims 19-44 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 20-43 of copending Application No. 10/575541. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of both applications claim loading fibers with calcium carbonate by adding calcium hydroxide or calcium carbonate to the fiber suspension and then introducing carbon dioxide and refining the stock. Both sets of claims have the same process conditions. The copending claims do not explicitly disclose the apparatus of instant claim 45, however it does disclose all the process steps of related to the apparatus of claim 45 and the apparatus as described in the instant claim would be obvious to a person of ordinary skill in the art to use to complete said process.

As for claim 19, the copending application claims loading a fibrous suspension with calcium carbonate (*A method of loading a fibrous stock suspension containing chemical pulp* [see e.g. claim 20]). The copending application then claims adding aqueous or dry calcium hydroxide or dry calcium oxide (*fibers with calcium carbonate, comprising the steps of: adding one of calcium oxide and calcium hydroxide in one of a liquid form and a dry form into the fibrous stock suspension* [see e.g. claim 290]). The copending application further claims adding carbon dioxide and claims refining the fibers (*adding gaseous carbon dioxide into the fibrous stock suspension; precipitating of the calcium carbonate through said carbon dioxide; and refining of the fibrous stock suspension during said precipitating step* [see e.g. claim 20 and 22]).

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While the copending claims disclose using flue gas as the source of CO₂ and removing the flue gas, this does not preclude the one-way obviousness over the instant application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

13. Claims 19-44 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 29-75 of copending Application No. 10/577511 in view of U.S. Patent Publication 2003/0010463 DOELLE, hereinafter DOELLE. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of both applications claim loading fibers with calcium carbonate by adding calcium hydroxide or calcium carbonate to the fiber suspension and then introducing carbon dioxide.

As for claim 19, the copending application claims loading a fibrous suspension with calcium carbonate (*A method of loading a fibrous stock suspension containing chemical pulp* [see e.g. claim 29]). The copending application then claims adding aqueous or dry calcium hydroxide or dry calcium oxide (*fibers with calcium carbonate, comprising the steps of: adding one of calcium oxide and calcium hydroxide in one of a liquid form and a dry form into the fibrous stock suspension* [see e.g. claim 29]). The copending application further claims adding carbon dioxide and claims refining the fibers (*adding gaseous carbon dioxide into the fibrous stock suspension; precipitating of the calcium carbonate through said carbon dioxide; and refining of the fibrous stock suspension during said precipitating step* [see e.g. claim 29]).

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The copending claims do not teach the crystal size, the reaction pressure or the temperature that the fiber loading process takes place at. DOELLE discloses the crystal size of 0.3 – 2.5 micrometers, the reaction pressure of 0.5 to 3 bar and a temperature of 20 to 90 degrees C [paragraph 0031]. At the time of the invention it would have been obvious to use the reaction temperatures and pressures of DOELLE to obtain the crystal sizes taught by DOELLE in the invention taught by the claims of the copending application. Since the conditions of producing calcium carbonate in DOELLE were known in the art it would be *prima facie* obvious to substitute the conditions of DOELLE for the process of the copending claims.

This is a provisional obviousness-type double patenting rejection.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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16. Claim 19, 21-30, 38-40, and 45 rejected under 35 U.S.C. 103(a) as being unpatentable by U.S. Patent #5,223,090 KLUNGNESS et al., hereinafter KLUNGNESS et al. in view of, *if necessary*, U.S. Patent #4,943,349 GOMEZ, hereinafter GOMEZ.

As for claim 19, KLUNGNESS et al. discloses two methods for adding calcium carbonate to fibers such as chemical pulped fibers (*A method of loading a fibrous stock suspension containing chemical pulp fibers with calcium carbonate*). The first method takes place under low shear (low energy) mixing in a pressurized container and high consistencies [column 6 lines 64-68 and column 7 lines 1-5]. The second method takes place at lower consistencies and under high shear refining [column 7 lines 5-40].

KLUNGNESS et al. further teaches adding calcium oxide or calcium hydroxide with water to the fibers (*adding one of calcium oxide and calcium hydroxide in one of a liquid form and a dry form into the fibrous stock suspension* [see e.g. column 6 lines 8-15]). Carbon dioxide is then added to the suspension of fibers which undergoes refining to precipitate out calcium carbonate. (*adding gaseous carbon dioxide into the fibrous stock suspension ;precipitating of the calcium carbonate through said carbon dioxide; and refining of the fibrous stock suspension during said precipitating step.* [see e.g. column 7 lines 5-42].)

The examiner has interpreted the claim as only not allowing homogenization after the calcium oxide is added and before the fibrous suspension reaches the refiner (*not utilizing any machinery for homogenizing the fibrous stock suspension*).

KLUNGNESS discloses a mixer to mix the pulp suspension with the calcium oxide [column 7 lines 16-41]. Subsequent to mixing the calcium oxide the pulp is fed into a refiner which has a transfer screw [column 7 lines 15-41]. Examiner notes that this

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transfer screw only moves the fiber and does not homogenize it (a transfer screw is not a screw press). KLUNGNESS does not disclose a screw press or a conditioning machine subsequent to the calcium oxide/hydroxide mixing device and prior to the refiner.

Therefore based on the examiners first interpretation that no homogenizing is allowed between the calcium oxide mixing and the refiner, KLUNGNESS clearly meets this limitation as the pulp is only mixed with calcium oxide and then sent to the refiner with no intervening steps.

The second possible interpretation of the applicant's claim limitation is that a static mixer is not machinery for homogenizing. In this case it would have been obvious to a person of ordinary skill in the art to substitute a static mixer for the rotating mixer of KLUNGNESS. GOMEZ discloses that for paper making fillers can be introduced to pulp by way of static mixers or by way of dynamic mixers (rotating mixer) [column 5 lines 19-30]. At the time of the invention it would have been obvious to a person of ordinary skill in the art to substitute a rotating dynamic mixer for a static mixer of GOMEZ to achieve the predictable result of mixing the pulp with the calcium oxide. It is *prima facie* obvious to substitute one known component for another known equivalent component to achieve a predictable result.

As for claim 21, KLUNGNESS et al. discloses that the pulp consistency is between 5 and 15% which falls within the instant claimed range [column 7 lines 5-10].

As for claim 22, KLUNGNESS et al. discloses the overlapping range of 5 to 15% for refiner treatment [column 7 lines 5-10] which overlaps the instant claimed range. Examiner has interpreted the refiner consistency as indicative of the mixing consistency.

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KLUNGNESS et al. further teaches the specific point of 2% for a mixing consistency which falls within the instant claimed range [see e.g. column 8 lines 60-65].

As for claim 23, KLUNGNESS et al. discloses that the pulp consistency is between 5 and 15% [column 7 lines 5-10]. KLUNGNESS et al. further discloses that the pulp is mixed with calcium oxide and water to the desired consistency [see e.g. column 6 lines 8-15]. Since the consistency of refining is 5-15% the desired consistency would be the same as the refining consistency. KLUNGNESS et al. further discloses that up to 50% by weight of cellulose or calcium hydroxide is added to the mixture. If the pulp slurry contains 5 grams pulp / 95 grams water and 50% calcium hydroxide is added then the total mixture by weight is 7.3%. If the pulp slurry contains 15 grams pulp and 85 grams water and 50% calcium hydroxide is added the mixture by weight would be ~21% solids by weight. Therefore the range of 7.3-21% solids of KLUNGNESS et al. anticipates the instant claimed range.

As for claim 24, KLUNGNESS et al. discloses that the calcium oxide or calcium hydroxide are mixed with the pulp [see e.g. column 6 lines 8-15]. KLUNGNESS et al. further discloses that on the bench scale the mixing takes place in a Hobart Mixer which the examiner has interpreted as an intermediate vat and mixed at low speed which the examiner has interpreted as a static mixer [see e.g. column 8 lines 35-40].

As for claim 25, KLUNGNESS discloses that the carbon dioxide is added to 5 to 15% stock [see e.g. column 7 lines 5-10]. Since the remainder of the stock is water the carbon dioxide has been added to a moist stock suspension.

As for claims 26-29, KLUNGNESS et al. further discloses a static mixer which mixes the components, the Hobart mixer, where the consistency is 2% which falls within

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the instant claimed range [see e.g. column 8 lines 35-40 and 64-66]. KLUNGNESS et al. also discloses a refiner is used as a reactor by causing shear which precipitates out the carbon dioxide, and also serves to mix the components for the 5 to 15% consistency pulp which falls within the instant claims [see e.g. column 7 lines 5-40]. KLUNGNESS et al. finally discloses a pressurized container, which the examiner has interpreted as the FPLCC reactor, where the consistency is 15% - 60% consistency, which is the instant claimed range [column 6 lines 64-69 and column 7 lines 1-5].

As for claim 30, KLUNGNESS et al. discloses that water is added during the calcium oxide addition step [see e.g. column 6 lines 8-15].

As for claim 38, KLUNGNESS et al. discloses a static mixer [column 6 lines 7-15 and column 8 lines 35-40]. KLUNGNESS et al. also discloses a refiner which has rotating components [see e.g. column 7 lines 5-40].

As for claims 39-40, KLUNGNESS et al. discloses the pressure range of 5 psig to 50 psig, which is 0.34 to 4 bar, and falls within both instant claimed ranges [see e.g. column 7 lines 1-5].

As for claim 45, KLUNGNESS et al. discloses an apparatus with a mixer for mixing in calcium oxide/hydroxide [see e.g. column 6 lines 8-15 and column 8 lines 35-40] and a refiner which refines the stock and precipitates out calcium carbonate by using the mixed calcium oxide and injected carbon dioxide [column 7 lines 5-40] which loads the fibers with calcium carbonate [see e.g. abstract].

The examiner has interpreted the claim as only not allowing homogenization after the calcium oxide is added and before the fibrous suspension reaches the refiner (*not utilizing any machinery for homogenizing the fibrous stock suspension*).

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KLUNGNESS discloses a mixer to mix the pulp suspension with the calcium oxide [column 7 lines 16-41]. Subsequent to mixing the calcium oxide the pulp is fed into a refiner which has a transfer screw [column 7 lines 15-41]. Examiner notes that this transfer screw only moves the fiber and does not homogenize it (a transfer screw is not a screw press). KLUNGNESS does not disclose a screw press or a conditioning machine subsequent to the calcium oxide/hydroxide mixing device and prior to the refiner. Therefore based on the examiners first interpretation that no homogenizing is allowed between the calcium oxide mixing and the refiner, KLUNGNESS clearly meets this limitation as the pulp is only mixed with calcium oxide and then sent to the refiner with no intervening steps.

The second possible interpretation to the applicant's claim limitation is that a static mixer is not machinery for homogenizing. In this case it would have been obvious to a person of ordinary skill in the art to substitute a static mixer for the rotating mixer of KLUNGNESS. GOMEZ discloses that for paper making fillers can be introduced to pulp by way of static mixers or by way of dynamic mixers (rotating mixer) [column 5 lines 19-30]. At the time of the invention it would have been obvious to a person of ordinary skill in the art to substitute a rotating dynamic mixer for a static mixer of GOMEZ to achieve the predictable result of mixing the pulp with the calcium oxide. It is *prima facie* obvious to substitute one known component for another known equivalent component to achieve a predictable result.

17. Claim 20 rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent #5,223,090 KLUNGNESS et al., hereinafter KLUNGNESS et al. in view of, if necessary, U.S. Patent #4,943,349 GOMEZ, hereinafter GOMEZ, as applied to claim 19 above, and

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further in view of as evidenced by U.S. Patent # 5,478,441 HAMILTON, hereinafter HAMILTON.

As for claim 20 KLUNGNESS et al. clearly teaches refining the pulp at 10-70 watt-hrs/kg (10-70 kW-hrs/mt) which falls within the instant claimed range [column 7 lines 12-15]. KLUNGNESS et al. does not explicitly state that a disperger is being used. However, dispergering is a type of refining. Furthermore, KLUNGNESS et al. does state that a 'devils tooth plate' is being used. A devils tooth plate is a type of disk surface that is used in a disperger as evidenced by HAMILTON [column 3 lines 1-15]. Alternatively, it would have been obvious to a person of ordinary skill in the art to use a disperger with the method of KLUNGNESS et al. for the reason that, both refiners and dispergers refine pulp, KLUNGNESS et al. states a devils tooth plate is useful and dispergers have this type of plate, and finally KLUNGNESS et al. states that any high shear mixing device may be used and it would have been obvious to try a known piece of high shear refining equipment such as a disperger.

18. Claims 43 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent #5,223,090 KLUNGNESS et al., hereinafter KLUNGNESS et al. in view of, if necessary, U.S. Patent #4,943,349 GOMEZ, hereinafter GOMEZ, as applied to claim 19 above, as evidenced by U.S. Patent 3,794,558 BACK, hereinafter BACK.

KLUNGNESS et al. discloses the residence time of the high consistency process to be 1 to 60 minutes [see e.g. column 7 lines 1 -5]. KLUNGNESS et al. does not explicitly state the residence time of the 5-15% consistency carbonate loading process in the refiner. However, refiners have low residence times as there is only a small volume which the pulp passes through. A typical refiner would have a residence time less than

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10 seconds with a time of 0.3 to 3 seconds being typical [see e.g. column 5 lines 2-6] all times which fall within the instant claimed ranges. Alternatively a person of ordinary skill in the art would be motivated to optimize the time in the refiner to effect the amount of reaction and the amount of refining done by the refiner.

19. Claims 33-37, 41-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent #5,223,090 KLUNGNESS et al., hereinafter KLUNGNESS et al. in view of, if necessary, U.S. Patent #4,943,349 GOMEZ, hereinafter GOMEZ, as applied to claim 19 above, and further in view of U.S. Patent Publication 2003/0010463 DOELLE, hereinafter DOELLE.

As for claim 33 and 34, KLUNGNESS et al. does not give guidance as to the temperature that the calcium oxide/hydroxide reaction with carbon dioxide should occur. DOELLE discloses that the carbon dioxide should be added at a temperature of -15 to 120 degrees C and preferably between 20 and 90 degrees C which are the instant claimed ranges [see e.g. paragraph 0031]. At the time of the invention it would have been obvious to a person of ordinary skill in the art to run the process of KLUNGNESS at the temperatures of DOELLE. A person of ordinary skill in the art would be motivated to combine the art of KLUNGNESS et al. and DOELLE because DOELLE describes the temperatures given as preferable to running the calcium carbonate reaction [paragraph 0031]. Applying a known temperature range of DOELL to the known device of KLUNGNESS et al. to obtain the predictable results of calcium carbonate loading would have been *prima facie* obvious.

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As for claim 41-42, KLUNGNESS et al. does not give guidance as to the pH that the calcium oxide/hydroxide reaction with carbon dioxide should occur. However, calcium carbonate and calcium oxide are basic so an initial basic pH would be expected. DOELLE discloses that the pH should be 6 to 10 which overlaps is the instant claimed range of claim 40. DOELLE also discloses the preferred pH range of 7 to 8.5 which falls within the instant claimed range of claim 41 [see e.g. paragraph 0031]. At the time of the invention it would have been obvious to a person of ordinary skill in the art to run the process of KLUNGNESS at the pH of DOELLE. A person of ordinary skill in the art would be motivated to combine the art of KLUNGNESS et al. and DOELLE because DOELLE describes the pH given as preferable to running the calcium carbonate reaction [paragraph 0031]. Applying a known pH range of DOELL to the known device of KLUNGNESS et al. to obtain the predictable results of calcium carbonate loading would have been *prima facie* obvious.

As for claims 35-37, DOELLE discloses that the calcium carbonate forms rhombohedral, scalenohedral, and spherical shapes [see e.g. paragraph 0035]. DOELLE further discloses the crystal size of 0.05 – 5 micrometers and 0.3 – 2.5 micrometers which are the instant claimed ranges. It is the examiners position, without evidence to the contrary that a person running the process of KLUNGNESS et al. using the conditions of DOELL would also obtain crystals of the shape and size of DOELL.

20. Claims 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent #5,223,090 KLUNGNESS et al., hereinafter KLUNGNESS et al. in view of U.S. Patent Publication 2002/0092636 RHEIMS et al. and Handbook for Pulp and Paper Technologists by SMOOK, hereinafter SMOOK.

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As for claim 36 and 37, KLUNGNESS teaches that for the high shear refiner the energy should be 10 – 70 kWh/ton [see e.g. column 7 lines 5-15]. KLUNGNESS does not teach the energy added in the low shear reactor. KLUNGNESS further does not teach a power input of the range 0.5 to 8 kWh/t. RHEIMS et al. teaches the overlapping range of 0.5 to 9 kWh/t. At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the energy range of 0.5 to 9 kWh/t. A person of ordinary skill in the art would be motivated to combine the art of KLUNGNESS et al. and RHEIMS because RHEIMS gives a known power input for the calcium carbonate reaction [paragraph 0031]. Applying a known power range of RHEIMS to the known device of KLUNGNESS et al. to obtain the predictable results of calcium carbonate loading would have been *prima facie* obvious. Furthermore, a person of ordinary skill in the art would be clearly motivated to adjust the range of power input as the power applied to fiber effects the properties (such as tear and tensile) of said fibers [see e.g. SMOOK pg 206]. Therefore a person of ordinary skill in the art would want to optimize the energy input to obtain the fiber qualities that are desired.

Conclusion

21. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY J. CALANDRA whose telephone number is (571) 270-5124. The examiner can normally be reached on Monday through Thursday, 7:30 AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Steven P. Griffin/
Supervisory Patent Examiner, Art Unit

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